

mating. Similarly it is only by selected inbreeding that any increase in the numbers of tumors in a strain can be produced. Thus, SLYE (*Jour. Cancer Res.*, 1920, v, 53), by selected inbreeding (mating brother and sister of a hybrid strain carrying a definite percentage of cancer) in three branches obtained new strains with widely varying cancer incidence. One branch gave a tumor-free line, a second yielded a heterozygous line (*i. e.*, mice not themselves developing cancer but carrying it potentially) while the third was an extracted tumorous line. Since the progenitors of each line were brothers and sisters, and they were bred in the same manner, inbreeding, *per se*, was obviously not a factor in occasioning an increase in cancer. "What is put into a mating, and not the manner of putting it in, determines what characters shall appear in the offspring." It was shown that inbreeding, by lowering the vitality and diminishing the fertility of a strain, could eliminate cancer by racial extermination. It is important, in the analysis of results on the incidence of cancer, either spontaneous or inoculated, to bear in mind that the lowering of the vitality of a strain through inbreeding as well as by the hybridizing of stock which gives rise to inferior and infertile strains tends to decrease the percentage of cancer within the strain. The author maintains that "in the demonstration of the inheritability of cancer and other tumor types in mice their inheritability for man and every other species in which they occur has also been demonstrated." Further, since cancer and non-cancer tendencies segregate out and are transmitted as such in hybrid crosses, cancer being a recessive, can be eliminated from the human race, where the matings are hybridizations, by selected mating.

**Varieties of Streptococci with Special Reference to Constancy.**—CLAWSON (*Jour. Infect. Dis.*, 1920, xxvi, 93) in a study of strains of streptococci isolated from various sources, paid particular attention to the constancy of the special characteristics, such as peculiarities of morphology, action on the blood-agar plate, fermentation of various carbohydrates, agglutination and complement-fixation reactions, in an attempt to discover whether the various classes adopted by previous workers have sufficient relationship to source, habits, pathogenesis or other particular characteristic to justify such grouping. From the author's investigations there seems to be no direct relationship between the length of chains and pathogenesis in streptococci. Capsules were found less commonly among hemolyzers than among non-hemolyzers. Of the 134 strains, hemolysis was constant after nearly two years of artificial cultivation, only 4 regularly failed to ferment lactose, only 2 always fermented mannit and only 3 always failed to ferment salicin. Evidence pointed to the fact that all non-hemolytic strains were methemoglobin producers when grown on suitable mediums, and of 150 non-hemolytic strains investigated, only 5 always failed to ferment lactose, 36 always fermented mannit and 75 always fermented salicin, there seeming to be more uniformity of fermentation among hemolytic than non-hemolytic streptococci. The regular type of fermentation placed most of the non-hemolytics in the class of *S. mitis* and *S. salivarius* (Holman). Considering the lack of relationship between fermentation reactions and source or pathogenesis, and the wide distribution of organisms falling into non-hemolytic groups, the author believes it is

doubtful whether any of the smaller groups of non-hemolytic streptococci deserve a place in classification. He also prefers the term *S. hemolyticus* to *S. pyogenes* and *S. viridans* to *S. buccalis* (Blake). It was further found that agglutination reaction between hemolytic organism and homologous serum showed a high degree of uniformity, while the reactions of hemolytic serum with non-hemolytic organisms, non-hemolytic serum with hemolytic organisms or non-hemolytic serum with non-hemolytic organisms, except the homologous strains, gave a low percentage of positive results. The reaction of hemolytic serum with hemolytic antigen yielded a higher percentage of complement-fixation than those of hemolytic serum with non-hemolytic antigen, or non-hemolytic serum with non-hemolytic antigen, or non-hemolytic serum with hemolytic antigen. From these observations it is concluded that the hemolytic group is a homogeneous group in which there is a relatively high degree of constancy and that the non-hemolytic group is heterogeneous or less homogeneous than the hemolytic group.

#### Observations on Paratyphoid Bacilli Recently Isolated from Animals.

—In a recent study of the tissues of several hundred swine which died of enteric diseases, SPRAY (*Jour. Infect. Dis.*, 1920, xxvi, 340) found the predominating bacterial flora to be members of the paratyphoid-enteritis group. The materials for study were obtained either from diarrheal swine by routine inoculations from heart blood, lung, liver and spleen, kidney and mesenteric glands, or from hog cholera virus by directly plating or inoculating the virus blood into rabbits. In the case of diarrheal swine the identity of all paratyphoid strains isolated from the various organs of the same carcass was not to be assumed, because in at least three instances, two or even three distinct strains were isolated from the same body. With few exceptions the strains were readily classified. Forty strains were studied in detail by the employment of arabinose, xylose, dulcitol, inositol, lead acetate agar, glucose serum water and agglutination and absorption tests; 23 of the forty strains were recovered from the tissues of diseased swine; 8 from hog cholera virus blood by plating and 9 from rabbits dying after inoculation with virus blood known to contain gas-producing bacteria. It was found that 34 of the 40 strains so studied were *B. suis*, 2 were identical with human *B. paratyphosus* A, 2 with human *B. paratyphosus* B and 2 were intermediate between *B. suis* and *B. paratyphosus* B. *B. enteritidis* was not encountered at any time. No true representative of the paratyphoid enteritis group was isolated from the feces nor from the lumen of the intestines. The author emphasizes this as he does the value of the selective cultural media mentioned above.

#### The Comparative Oxygen Avidity of Normal and Malignant Cells Measured by Their Reducing Powers of Methylene Blue.

—An interesting comparison of the reducing power of normal tissue and that of tumors is made by DREW (*British Jour. Exper. Path.*, 1920, i, 115) by means of methylene blue. A measured quantity (0.3 to 0.5 c.c.) of minced tissue was placed in a tube to which was added a definite amount of 0.001 per cent. methylene blue in Locke's solution minus the glucose. In order to prevent reoxidation a layer of paraffin was poured over each tube, which was then incubated at 37° C. During incubation the methylene blue became reduced to methylene white